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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/528,074

03/17/2005

Hugues Van Den Bergen

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EXAMINER

CHIMIAK, EMILY ANN

ART UNIT

PAPER NUMBER

1733

MAIL DATE

DELIVERY MODE

06/12/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/528,074

Applicant(s)

VAN DEN BERGEN ET AL.

Examiner

Emily Chimiak

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☒ Claim(s) 2, 3, 5, 7-10 and 13-20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>09/27/2005 and 03/27/2005</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: On page 11, line 24, the phrase "another example of a boron containing monomer" is mentioned but no boron monomer examples are previously disclosed.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. Claims 2, 3, 5, 7-10 and 13-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. As to claim 2, reciting "(flame retardant polymer precursor)" in parentheses after the phrase "the cured composition (claim 2 line 3) is unclear because the cured composition does not contain precursors. Claims 3 and 4 depend from claim 2. As to claim 3, the parenthesis around the phrase "or combination of both" renders the claim unclear. Because of the parentheses, is unclear whether a combination of both is a limitation. As to claims 5, it is uncertain whether the cured composition consists of the flame retardant monomer, and it is uncertain whether "flame retardant monomer" is a limitation because of the phrase "the cured composition (flame retardant monomer)." Claim 6 depends from claim 5. As to claim 7, it is not clear whether the unsaturated monomers are required to be non-flame retardant because parentheses enclose the phrase "non-flame retardant." Claim 8 depends from claim 7. Claim 9 is objected for the same reason as claim 5. Claim 10 depends from Claim 9. Claim 13 is similarly objected to. Claims 15-20 depend from claim 13. For the purpose of

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examination, the phrases in parentheses will not be considered limitations). Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Louis et al. (4426240). Louis et al. discloses bonding laminated glass using a transparent composition that is curable by ultraviolet radiation and includes a flame retardant additive (col. 4 line 31 54-55 and 65-68 and col. 5 lines 3-5).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1, 2-5, 7, 9, 12-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nolte et al. (US 4104427) in view of Van Den Bergen '826.

As to claims 1 and 13, Nolte et al. discloses coating plastics with embedded intumescent material on glass panes, and providing the same material as a curable adhesive layer between the panes in order to provide a transparent fire resistant layer. (col. 3 lines 23-25, 60, col. 4 lines 8-19 and 25-26). Nolte et al. does not disclose the radiation curable composition. However, Van Den Bergen '826 discloses a transparent flame retardant coating that is radiation curable and that may be used with any substrate. Van Den Bergen '826 discloses that the intumescent material such as that proposed by Nolte et al. is inferior because additives can migrate through the coating to the surface which can lead to blooming and because additives may discolour the composition (page 2 lines 1-5, page 26 lines 12-13, page 45 lines 4-5). To prevent these drawbacks, Nolte et al. must form a protective stratum and must compromise between light transmission before exposure to fire and fire resistance (col. 3 lines 67-col. 4 line 2). The coating disclosed by Van Den Bergen comprises at least one radiation curable polymer precursor having polymerizable ethylenically unsaturated functions providing flame retardant properties to the cured composition (page 11 lines 1-5). It would have been obvious at the time of invention to one of ordinary skill in the art to apply the coating disclosed by Van Den Bergen in the lamination procedure disclosed by Nolte et al. to avoid the aforementioned disadvantages of intumescent additives separate from the resin.

As to claims 2-5, Van Den Bergen '826 discloses that the radiation curable polymer precursor provides flame retardant properties to the cured composition, comprises one or more

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radiation curable phosphorus containing polymer precursors which have, at the chain ends or laterally along the chain, acrylic, methacrylic or vinyl groups, wherein the radiation curable polymer comprises phosphorus containing urethane acrylate, and wherein the composition contains a radiation curable monomer which is phosphorus containing to contribute to flame retardant properties of the cured composition (see the above rejection of claim 1).

As to claim 9, Nolte et al. discloses including titanium oxide as a coating material when aluminum phosphate is used (col. 4 lines 55-58). However, Nolte et al. as modified does not disclose using tin oxide in the general embodiment. Van Den Bergen '826 discloses including magnesium oxide, i.e. an additive that is not a copolymerizable, non reactive, inorganic compound contributing to the flame-retardant properties (page 46 line 22). It would have been obvious to one of ordinary skill in the art at the time of invention to include magnesium oxide in the coating as taught by Van Den Bergen '826 for improved flame retardant properties.

As to claim 12, Nolte discloses a flame-retardant light-transmitting laminate (abstract). As to claims 14 and 16, the rejection of claim 4 is relied on.

5. Claims 8, 15, 17 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nolte et al. and Van Den Bergen '826 as applied to claim 7 above, and further in view of Takasi et al. (WO 98/36325).

As to claims 7, 8 and 15, Nolte et al. does not disclose methacrylic acid as a non flame retardant monomer in the coating. However, Van den Bergen discloses that the phosphorus

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content must be chosen according to its end use and discloses that the polymer precursors of the invention can be copolymerized by reacting with other monomers (page 18 lines (page 1 lines 25-29, page 15 lines 9-10 and page 18 lines 22-24). Takasi et al. discloses that (meth)acrylate may be added as necessary depending on the particular application and such that the glass transition temperature is not too low and is not excessive (page 16 lines 5-10 and 24 and page 20 lines 22-30). It would have been obvious to one of ordinary skill in the art at the time of invention to include a proportion of methacrylic acid as taught by Takasi et al. in the coating disclosed by Nolte et al. to modify the composition depending on the standard of fire resistance and the physicochemical and mechanical properties desired.

As to claim 17, Nolte et al. does not disclose a coating comprising 9, 10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide. Van Den Bergen '826 discloses the flame retardant polymer precursor comprising 9, 10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide as an additional flame retardant additive (page 46 line 13). It would have been obvious to one of ordinary skill in the art at the time of invention to include 9, 10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide as taught by Van Den Bergen '826 in the coating disclosed by Nolte et al. in order to improve the flame retardant properties.

As to claim 19, in one embodiment, Nolte discloses including hydrated alkali metal silicates because they adhere well to glass, but does not disclose incorporating it in a radiation curable composition (col. 3 lines 41-45). Van Den Bergen '826 discloses adding silicate derivatives to improve flame retardant properties (page 46 line 23). It would have been obvious to one of ordinary skill in the art at the time of invention to include hydrated alkali metal silicates

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as taught by Van Den Bergen '826 in the coating disclosed by Nolte et al. to improve flame resistance and adherence.

As to claim 20, Nolte et al. teaches curing in a furnace. However, Van Den Bergen '826 teaches that irradiation is an equivalent curing method to thermal heating (page 1 lines 13-15). It would have been obvious at the time of invention to one of ordinary skill in the art to cure with irradiation as taught by Van Den Bergen '826 in the procedure disclosed by Nolte et al. because it is an equivalent curing method to heating.

As to claim 21, the rejection of claim 19 is relied on.

6. Claim 6 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nolte et al. in view of Vollkommer et al. (US 4128709).

Nolte et al. as applied to the rejection of claim 1 above is relied on. It is noted that Nolte et al. discloses employing a hydrated metal salt and protective plastics layer as the flame resistant layers (col. 3 lines 30-33 and col. 4 lines 13-20). Nolte et al. does not disclose the radiation curable composition or a halogen containing radiation curable monomer. However, Vollkommer et al. teaches replacing the protective plastics layer and oxides with radiation-curable pentabromobenzylacrylate to prevent the oxides from chalking out of the coating and because pentabromobenzylacrylate has more fire-retardant action. (col. 1 lines 62-67, col. 2 lines 8-11, col. 5 lines 34-35 and col. 6 lines 8-9 and 22-24). It would have been obvious at the time of invention to one of ordinary skill in the art to use a composition comprising pentabromobenzylacrylate as the flame retardant layer as taught by Vollkommer et al. because it

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is more effective than the flame retardant layer disclosed by Nolte et al. and because it will not chalk out of the coating.

7. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nolte et al. and Van Den Bergen '286 as applied to claim 1 above, and further in view of Takahashi (US 4126593) and Wu et al. (US 5460872).

Nolte et al. as modified by Van Den Bergen discloses a coating comprising a diluent and inorganic oxides (flame retardant) that are surface treated to improve their compatibility with the polymers to which they are added, but does not disclose that the inorganic oxides are nanoparticles that are functionalized with acrylate or methacrylate functions (page 2 line 3, page 40 lines 34-37 and page 46 lines 29-31). However, Takahashi teaches coating an ester onto inorganic hydroxide powder to eliminate silver streaks that form because the uncoated powder is hygroscopic (col. 3 lines 2-3 and col. 4 lines 6-7, 17-20 and 45). Wu et al. teaches that emulsions comprising 0.01-0.1 micrometer particles of methacrylates have several advantages over conventional dispersions of methacrylates, including better transparency (col. 1 lines 57-60 and col. 2 lines 27-28 and 45-46). It is noted that the advantage of dispersing small particles applies to any emulsion. It would have been obvious at the time of invention by one of ordinary skill in the art to use nanoparticles coated with methacrylate as taught by Takahashi and Wu et al. in the composition disclosed by Van Den Bergen to produce a transparent coating for the lamination method disclosed by Nolte et al.

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Conclusion

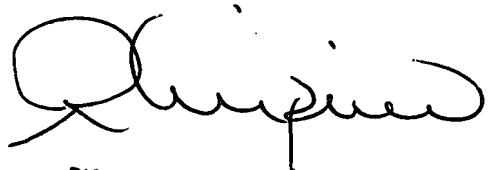
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emily Chimiak whose telephone number is (571)272-6486. The examiner can normally be reached on Monday-Friday 8:30-5:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571)272-6486. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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